

Related Rates

1. A small water droplet falls into a pond, causing ripples of the form of a circle. The radius r of the outermost ripple is increasing at a constant rate of 3 feet per second. When the radius is at 5 feet, what rate is the total area A of disturbed water changing? Hint: Area of a circle is $A = \pi r^2$.
2. We are inflating a spherical balloon at a rate of 2 cubic inches per second. Find the rate of change of the radius when the radius is 8 inches. Hint: Volume of a sphere is $V = \frac{4}{3}\pi r^3$.
3. A drone is on a straight flight path that takes it directly over a spectator while maintaining an altitude of 1 kilometer. If the distance l is decreasing at a rate of 20 kilometers per hour when the drone is 2 kilometers away, what is the speed of the drone?